REMARKS/ARGUMENTS

Amendment to the Drawings:

Applicants gratefully acknowledge indication that the drawings have been approved by the Examiner. The corrected and approved replacement drawings are enclosed with this amendment.

Claim Status:

Claims 1, 3-4, 6-13 and 16-17 remain in this application. Claims 2 and 9 have been canceled. Claims 1 and 7 have been amended.

Claim Rejections:

Claims 1, 3-4 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Auzel et al (U.S. Patent 5,858,891).

Claim 1 has been amended to incorporate the subject matter of the original (now canceled) claim 2. Claim 1 calls for a glass-ceramic rare earth doped fiber comprising a plurality of crystallites, wherein (i) at least 90% of the rare earth dopant is situated within said crystallites; (ii) stimulated emission and absorption line shapes of said glass-ceramic rare earth doped fiber are narrower than that stimulated emission and absorption profile of its precursor rare earth doped glass, and (iii) wherein said crystallites are 1000-nm or smaller.

The Office Action states that although the Auzel reference does not disclose the feature of " stimulated emission and absorption line shapes of said glass-ceramic rare earth doped fiber are narrower than that stimulated emission and absorption profile of its precursor rare earth doped glass", it would have been obvious to make a fiber out of the

Auzel material and the resultant fiber "would necessary have stimulated emission and absorption line shapes narrower than its precursor rare earth doped glass, since dopants within the crystallites would create the sharper shapes compared to dopants outside the crystallites."

Applicants respectfully disagree for the following reasons:

The claimed material characteristic of the fiber is not an inherent or a necessary property of the glass–ceramic materials like the one described by the Auzel reference. This is because the relative surface size of the crystallites also affects the emission and absorption line widths. As crystallite sizes diminish, the effects due to crystallite's surface size begin to dominate. Depending on a particular crystallite composition and on overall material composition, the line widths or have stimulated emission and absorption of the resultant fiber may not be narrower than that exhibited by the precursor rare earth doped glass, due to the surface size of the crystals. Fluorozirconates (disclosed by the Auzel reference) are complicated systems and the smaller crystal sizes in these systems actually result in broadening of emission and absorption line widths. Thus, although applicants example show that the fiber exhibits the above claimed narrowing property, in other systems broadening due to crystal size may overwhelm the effects of the crystalline environment.

Therefore, absent the disclosure in the cited reference(s), and given that the Auzel reference does not disclose a material in which the claim property is inherent, applicants' claimed invention is not unpatentable over Auzel et al (U.S. Patent 5,858,891).

Claims 3, 4 and 6 depend from claim 1 as their base claim and, therefore, explicitly incorporate the language of claim 1. Therefore, claims 3, 4 and 6 are not unpatentable over Auzel et al for the same reasons that claim 1 is not unpatentable over Auzel et al.

Claims 7-12, 16 and 17, stand rejected under 35 U.S.C. 103(a) as being unpatentable over Auzel et al in view of Ainslie et al (U.S. Patent 4,936,650).

Claim 7 is similar to claim 1 in that it specifies: "said crystallites are 1000-nm or smaller and stimulated emission profile of said glass ceramic fiber is narrower than that stimulated emission profile of its precursor rare earth doped glass." Even if the Auzel material could be made in into a fiber, contrary to the Examiner's assertion, this is not a feature that is necessarily present in the fiber.

Therefore, claims 7-12, 16 and 17 are not unpatentable over Auzel et al in view of Ainslie et al (U.S. Patent 4,936,650).

Furthermore, regarding claims 16 and 17, the presence of Nd dopant does not guarantee the narrowing of the spectrum, even if all active ions are in crystal phase, because of the rall played by the relative surface area of crystallites.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Auzel et al in view of Ainslie et al as applied to claim 7 above, and further in view of Arima (U.S. Patent 6,217,204).

Claim 13 depends from claim 7 as its base claim and, therefore, explicitly incorporates the language of claim 7. Therefore, claim 7 is not unpatentable over Auzel et al in view of Ainslie et al as applied to claim 7 above, and further in view of Arima (U.S. Patent 6,217,204).

In the section of the Office Action titled "**Response to Arguments**" (pg. 6) the Examiner states that one of ordinary skill would not make a fiber in the way discussed by the Applicants (by re-heating at high temperatures suitable for fiber draw above liquidus), because of alternations to its make up, as alleged by the Applicants. The Examiner than suggests that "one of ordinary skill in the art would...just melt the material at the same melting temperature that one is used when creating the glass material and then mold and heat treat the fiber to desired fiber shape instead of planar waveguide shape."

However, one does not make fiber by a molding process. Furthermore, even if the fiber was heated to the same melting temperature that one used in creating the glass material (as suggested by the Examiner), the material will become too fluid (not viscous enough) and the fiber can not be formed. Thus, the Examiner's suggestion of how to make fiber so as to retain the desirable properties of the glass ceramic material does not work.

Finally, since the required drawing temperature (viscosity driven) and the crystal formation temperature are about the same, the crystallites in the original glass ceramic materials would not normally dissolve and then reform at their previous size. Instead, the amount of crystals and their sizes would continue to grow, making fiber with bigger crystals, and thus with different properties from what was originally intended. This is because once the crystallites are formed, heating the resultant glass-ceramic material to the original crystal forming liquidis temperature will not dissolve the existing crystallites, but will precipitate more crystallization and create bigger crystals. Thus, without applicant's teachings looking for the claimed fiber or device would be akin to looking for a needle in a haystack.

The cited prior art does not disclose glass ceramic fibers with the claimed property, nor suggest that it can be done. **As Examiner knows, a prima facie case of obviousness requires a suggestion or motivation to combine, a reasonable expectation of success, and a teaching or suggestion of all claim limitations.** (MPEP §2143.) However the teaching of cited prior art do not provide one knowlegable in the art with the motivation for success. The teaching or suggestion to modify the cited refererences. in a manner suggested by the Examiner must be found in the prior art and must provide one with the reasonable expectation of success. The teaching or suggestion to modify cannot be found in Applicant's disclosure. **"Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references,"** In re Dembiczak, 175 F.3d 994, 999, 50

USPQ2d 1614, 1617 (Fed. Cir. 1999). Thus, applicants claims are not obvious over the cited art.

Conclusion

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Svetlana Z. Short at 607-974-0412.

Respectfully submitted,

DATE: 9/29/04

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Amendment to the Drawings:

The attached sheet of drawings include changes to Figure 1. This sheet, which includes Figure 1, replaces original sheet including Figure 1.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes

FIG. 1